



UNITED STATES PATENT AND TRADEMARK OFFICE

A

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/613,791

07/03/2003

Jiang Hsieh

15-CT

1516

7590

03/09/2006

Patrick W. Rashe
Armstrong Teasdale LLP
One Metropolitan Square, Suite 2600
St. Louis, MO 63102

EXAMINER

ARTMAN, THOMAS R

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/613,791		HSIEH ET AL.	
	Examiner		Art Unit	
	Thomas R. Artman		2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-21 is/are allowed.
- 6) ☒ Claim(s) 22,23,28 and 30-32 is/are rejected.
- 7) ☒ Claim(s) 24-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03 July 2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 27th, 2006, has been entered.

Oath/Declaration

The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414. Applicants' statement of error fails to identify by reference the specific claim(s) and the specific claim language wherein lies the error, as required by MPEP § 1414, Item II (C).

Claims 1-32 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the declaration is set forth in the discussion above in this Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9-11, 19-21 and 30-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As is best understood by the examiner, col.6, lines 9-27, of the specification describe a method where two images, representing two different phases of the same organ (heart), are taken at different times and with different rows of the detector in a single pass of the patient table.

Claims 9, 19 and 30, on the other hand, each specify that the first and second images, corresponding to the first and second phases of the heart, are acquired “at the same time.” This is not supported by the specification, since the specification clearly states that the images are taken at different times. Therefore, one of ordinary skill in the art is not enabled to make and use the invention as claimed.

Claims 10, 11, 20, 21, 31 and 32 are rejected under this section by virtue of their dependency.

The claims shall be examined as best understood by the examiner and not inconsistent with the specification.

Art Unit: 2882

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-11, 19-21 and 30-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 9, 19 and 30, it is unclear how different phases of the heart can be acquired simultaneously, even with different rows of the same detector. The required time lag for imaging two different phases of the heart is not achievable when the imaging steps are “performed at the same time.”

Claims 10, 11, 20, 21, 31 and 32 are rejected under this section by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Meno (US 4,716,904).

Regarding claim 22, Meno discloses a method, including:

a) imaging a heart at a first phase of a cardiac cycle to obtain a first image,

Art Unit: 2882

b) imaging a heart at a second phase of the cardiac cycle different from the first phase to obtain a second image, and

c) determining a difference image using the first and second images (col.4, line 52 through col.5, line 23).

With respect to claim 29, Meno further discloses that an EKG signal is monitored (physiological monitor 22 of the heart 8) in order to take images at desired phases of the heart (col.3, line 52 through col.4, line 7; col.5, lines 20-23).

Claims 22 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Haendle (US 4,433,428).

Regarding claim 22, Haendle discloses a method, including:

- a) imaging a heart at a first phase of a cardiac cycle to obtain a first image,
- b) imaging a heart at a second phase of the cardiac cycle different from the first phase to obtain a second image, and
- c) determining a difference image using the first and second images (col.1, lines 6-13 and lines 40-50).

With respect to claim 29, Haendle further discloses that an EKG signal is monitored in order to take images at desired phases of the heart (col.1, lines 6-13 and lines 40-50).

Art Unit: 2882

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haendle.

With respect to claim 23, Haendle does not specifically disclose the practice of having the patient hold their breath during the imaging procedure.

However, it is known in the art to have the patient hold their breath during heart imaging procedures in order to remove movement artifacts caused by the lungs. This allows the image subtraction to be useful, since the stationary structures will properly cancel out, and only movement caused by the heart will remain.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Haendle to have the patient hold their breath during the imaging procedure in order to improve the difference image results by removing movement artifacts caused by respiratory motion.

Art Unit: 2882

With respect to claim 28, Haendle does not specifically disclose the practice of enhancing the differenced image.

However, it is known to one skilled in the art to enhance the image, such as sharpening edges, etc., in order to enhance the resultant image for better visualization by the operator/doctor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Haendle to enhance the difference image such that a cleaner, more useful image is achieved.

Allowable Subject Matter

Allowable subject matter over the prior art of record is indicated as follows:

The prior art of record neither teaches nor reasonably suggests a CT imaging system and method of use, where a difference image is determined from two CT scout scans of a heart taken at two different phases, as required by the combination as claimed in each of claims 1 and 12.

Claims 2-11 and 13-21 are indicated under this section by virtue of their dependency.

The prior art of record neither teaches nor reasonably suggests the additional method step of identifying calcification deposits on portions of the difference image corresponding to moving body structures of the patient, as required by the combination as claimed in claim 24.

Claims 25-27 are indicated under this section by virtue of their dependency.

Art Unit: 2882

The prior art of record neither teaches nor reasonably suggest the additional method step of taking the first and second images using different rows of the detector in one pass of the patient table, as required by the combination as claimed in claim 30.

Claims 31 and 32 are indicated under this section by virtue of their dependency.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reitter (US 5,583,901) teaches a similar method of subtracting images taken at different phases of patient motion in order to reveal movement. Kruger (US 4,677,478) teaches the practice of TID imaging, where two images are taken at different phases of motion and subtracted in order to reveal movement. Kruger (US 4,456,926) teaches a filter function that is used to reveal motion of objects in a patient. Riazat (US 6,690,965 B1) teaches taking the time difference of optical images in order to determine patient motion for physiological gating of an X-ray source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER